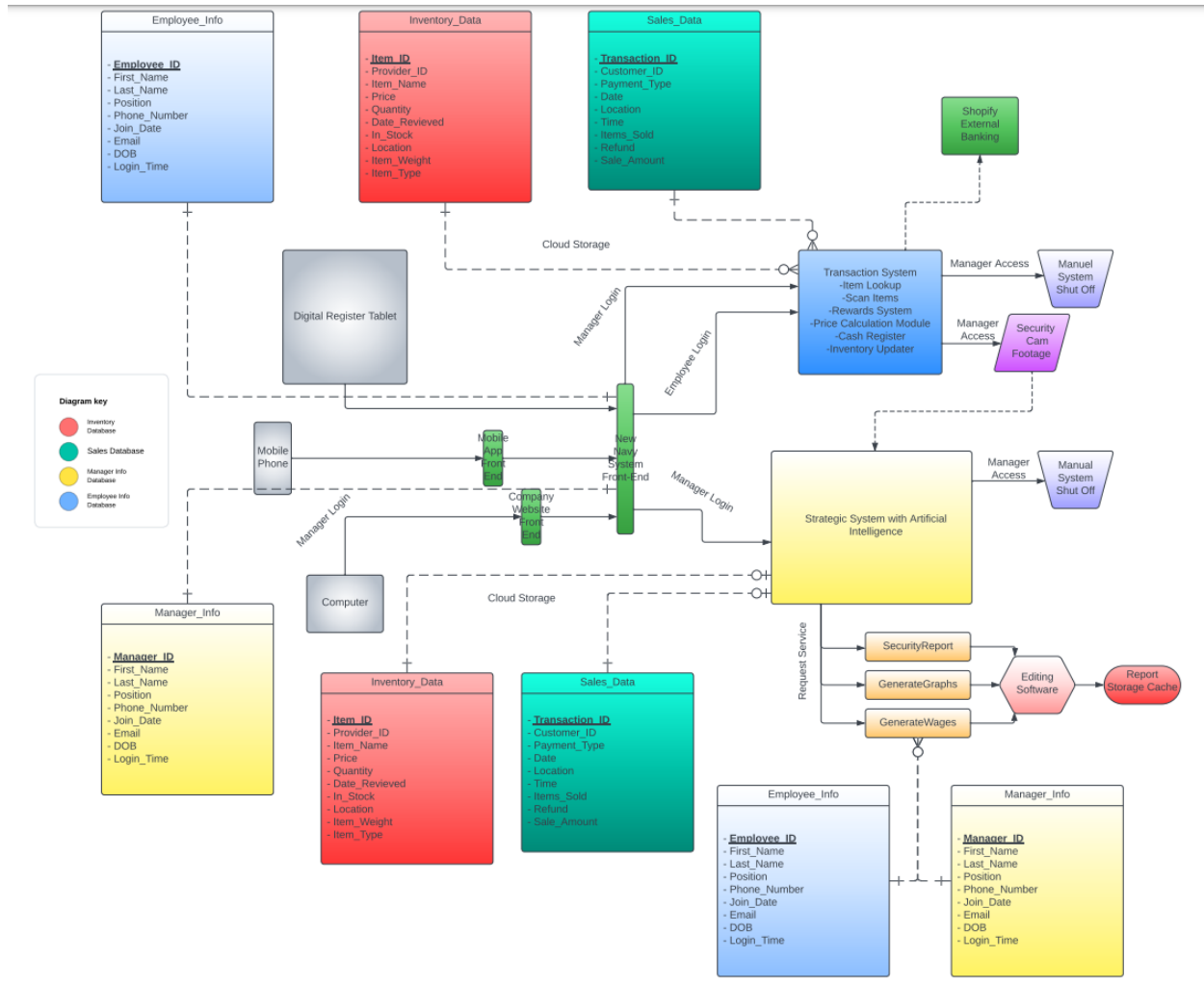


Software Design 2.0

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Software Architecture Diagram:



Design Specification:

We modified the original SWA diagram by adding SQL representations of the additional databases (Employee_Info and Manager_Info) as well as the previously established databases (Inventory_Data and Sales_Data). The crow's-foot notation of the database entities within the diagram show the relationships that exist between the databases and the software architecture and its processes. Firstly, the two relationships between Employee_Info and Manager_Info with the “New Navy System Front-End” entity shows one-to-one relationships. This is because the system front-end and the databases act as strong entities, with the ability to exist on their own. The relationships between Inventory_Data and Sales_Data with the “Transaction System” entity shows a one-to-many optional relationship, meaning that the single databases apply to multiple instances of the transaction system since there are constant, or none, operations taking place. Once more, the relationships between Inventory_Data and Sales_Data with the “Strategic System with Artificial Intelligence” entity shows a one-to-one optional relationship, meaning that the databases offer data to the system optionally, but they can exist independently of each other. Lastly, the relationship between Employee_Info and Manager_Info with the “Generate Wages” process shows a one-to-many optional relationship, since generating wages requires a call to the employee and managerial databases in order to calculate the correct wages corresponding to each person. It is optional because the system is not required to generate wages.

Data Management Strategy:

Inventory:

	A	B	C	D	E	F	G	H	I	J	K
1	Item_ID	Provider ID	Item_Name	Price	Quantity	Date_Recieved	In_Stock	Location	Item_Weight	Item_Type	Contributors
2	19759536	28100774	Frosted Flakes	5.29	35	11/5/2023	Yes	San Diego	4	Cereal	Steven Al-Sheikh
3	78366385	82857695	Buzz Lightyear A	45.95	25	11/5/2023	Yes	San Diego	4	Toy	Brandon Perillo
4	15643453	14479515	Mario T-Shirt	14.99	35	11/5/2023	Yes	San Diego	1.4	Clothing	
5	84138362	69309458	Luigi T-Shirt	14.99	35	11/5/2023	Yes	San Diego	1.4	Clothing	
6	98460284	31850623	Cocoa Puffs	5.29	25	10/21/2023	Yes	San Diego	3	Cereal	
7	46029297	62259751	Cheerios	3.99	25	10/21/2023	Yes	San Diego	3	Cereal	
8	57149127	93408121	Lego Bionicle Se	224.94	1	10/21/2023	No	La Jolla	5	Toy	
9	88250339	28381100	Carhartt Men's T	49.99	15	10/12/2023	Yes	La Jolla	1.75	Clothing	
10	23630456	81033926	Old Navy Men's	14	15	10/12/2023	Yes	La Jolla	1.5	Clothing	
11	44200917	64109613	Fedora	89	3	9/28/2023	No	La Jolla	0.5	Clothing	

Sales Data:

	A	B	C	D	E	F	G	H	I
1	Transaction_ID	Customer_ID	Payment Type	Date	Location	Time	Items_Sold	Refund	Sale Amount
2	61169451	44346694	Debit	1/18/23	San Diego	3:15 PM	16	N/A	\$59.64
3	25306392	52252693	Credit	1/29/23	San Diego	2:28 PM	12	3 items	\$29.87
4	18622296	78737107	Credit	2/3/23	San Diego	1:39 PM	4	N/A	\$12.48
5	79219173	91125126	Cash	2/7/23	La Jolla	2:00 PM	8	2 items	\$13.24
6	92185593	81538347	Gift Card	2/13/23	La Jolla	9:19 AM	9	N/A	\$20.54
7	48350768	15407510	Cash	2/17/23	Chula Vista	10:27 AM	15	4 items	\$43.61
8	21391173	53831380	Debit	2/21/23	Chula Vista	8:38 AM	23	N/A	\$89.32
9	72644078	42592058	Cash	3/4/23	Santee	7:21 PM	19	2 items	\$38.43
10	27699093	86309316	Gift Card	3/11/23	La Mesa	4:04 PM	7	1 item	\$11.23
11	47978773	38697157	Cash	3/15/23	La Mesa	5:26 PM	5	N/A	\$14.69

Employee Info:

	A	B	C	D	E	F	G	H	I
1	Employee_ID	First_Name	Last_Name	Position	Phone Number	Join date	Email	DOB	Login_Time
2	90733039	Amanda	Arnolds	Product Leader	619-691-2932	9/13/22	aarnolds@yahoo.com	3/29/1993	1:29 PM
3	27787299	Liraz	Enkh	Senior Developer	619-728-9372	9/8/22	lenkh@yahoo.com	2/29/1995	9:29 AM
4	89143780	Kamala	Radha	Senior Developer	205-372-8271	9/4/22	kradha@yahoo.com	4/19/1997	8:38 AM
5	25325920	Matija	Enitan	ICS	619-730-2239	9/19/22	menitan@yahoo.com	9/29/1999	7:29 AM
6	53292016	Ailbe	Veasna	CSR	480-128-1937	9/21/22	aveasna@yahoo.com	5/16/1998	2:23 PM
7	56866221	Swaran	Kenojuak	ICS	619-102-3928	10/3/22	skenojuak@yahoo.com	3/12/1998	4:38 PM
8	52181124	Jewel	Beren	CSR	205-105-2740	10/28/22	jberen@yahoo.com	4/3/2000	12:11 PM
9	55780733	Anma	Mikhayahu	CSR	480-037-9485	11/3/22	amikhayahu@yahoo.com	3/11/2000	5:36 PM
10	63407840	Mahpiya	Georgie	ICS	619-204-5693	11/19/22	mgeorgie@yahoo.com	7/11/1997	7:39 PM
11	23431199	Inari	Shirley	ICS	480-328-9860	12/3/22	ishirley@yahoo.com	8/28/1999	3:24 PM

Manager Info:

	A	B	C	D	E	F	G	H	I
1	Manager ID	First_Name	Last_Name	Position	Phone Number	Join date	Email	DOB	Login_Time
2	70287175	Karabo	Temple	CEO	619-482-4921	1/5/22	ktemple@yahoo.com	3/4/1989	3:04 PM
3	41534613	Jaiden	Sibonakaliso	CFO	619-293-8203	1/7/22	jsibonakaliso@yahoo.com	9/4/1993	2:11 PM
4	87362488	Khumbo	Chanda	CTO	619-203-3921	1/9/22	kchanda@yahoo.com	2/23/1997	4:08 PM
5	76431334	Garnett	Vanja	Store Manager	619-032-0285	7/23/22	gvanja@yahoo.com	9/18/1998	11:23 AM
6	84721769	Sung-Hyun	Chi	Store Manager	619-845-8321	8/9/22	schi@yahoo.com	7/24/1998	10:38 AM
7	16837227	Mohinder	Chikondi	Assistant	977-335-9874	9/12/22	mchikondi@yahoo.com	11/7/1999	9:15 AM
8	15500997	Chifuniro	Kunzang	Assistant	910-749-9823	10/28/22	cjunzang@yahoo.com	5/6/2000	9:45 AM
9	99133979	Zola	Keshet	IT Manager	706-874-7621	4/29/22	zkeshet@yahoo.com	6/22/2001	9:42 PM
10	61990288	Jindra	Desi	Operations Manager	207-382-2349	2/12/22	jdesi@yahoo.com	2/26/1998	7:13 PM
11	85435831	Wangchuk	Enu	District Manager	929-729-9434	3/13/22	wenu@yahoo.com	1/17/1997	6:38 PM

Data Management Strategy Description:

Our data management strategy utilizes Structured Query Language (SQL) in order to create a more efficient and standardized environment for holding the various categories of data produced by the New Navy Store software system. We utilize a table structured SQL and use them for four important categories, with each of the tables having different fields to store various attributes of records.

Trade Off Discussion:

We have decided to use four records and field table databases on google sheets. We have decided to go with SQL databases because the data is relational, and they are better for applications that need data for transactions. We chose to create four databases that represent the inventory, sales data, employee info, and manager info. We needed to create these databases in order to store data for employee info and management info which includes their names, id, position, email, etc and we needed a database for inventory and sales so the employees and managers can access and see what items and how many items are in stock at the warehouses and stores, and how much they have made in sales. We have used the table method simply because they are relational, easy to look at, have a well-designed predefined schema for structured data, scalable, and these SQL databases are suitable for financial transactions which is needed for the retail company. A possible alternative we could have made is we could have created a noSQL graph database where data is organized as nodes and edges, this also supports a richer

representation of data relationships. We could have also done a Key-Value noSQL database where the data is represented as a collection of key-value pairs, we could have had the key(ID) point towards the type of product in the inventory and more. The reason why we didn't choose any of these alternatives was because we saw many flaws with noSQL databases such as that it lacks the ability to perform dynamic operations, not good for financial transactions, does not guarantee the consistency, integrity, and durability of data, and more flaws. While noSQL databases can handle a huge volume of structured and unstructured data, we wanted to give that up in return of ensuring that we can guarantee the ACID properties with the SQL databases, which ultimately led us to decide to make an SQL database.